Space Weather Forecast

Issued on Thursday, 30 March 2023 at 00:16 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storming from late day 1 (30th) until day 3 (1st April). Chance of isolated Moderate flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has reached High levels over the past 24 hours, following a strong flare at 29/0233UTC, and two moderate flares at 29/1406 UTC and 29/2346 UTC respectively from an active region approaching the southwest limb.

There are currently seven numbered and five unnumbered sunspot regions on the visible disc. The aforementioned large and magnetically complex region near the southwest limb. The other active regions appear stable and magnetically simple, with only minor fluctuations in areal extent. No Earth-directed CMEs currently feature in the forecast.

Solar Wind / Geomagnetic Activity: The solar wind was mostly at background to slightly elevated levels. The Interplanetary Magnetic Field (Bt) was mostly weak between 6-9nT, with the north-south component (Bz) also weak. The net result of the above solar wind measures was for mostly Quiet (Kp 0-2) geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be predominantly Low, but with a Chance of further isolated moderate class flares. The main region likely to give such flares is the largest and most complex region close to southwest limb.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections currently feature in the forecast. The next coronal hole high speed stream is expected to impact Earth from late on day 1 (30th), lasting until day 3 (1st), with speeds likely to reach elevated levels. Solar wind speeds will then likely return back to slightly elevated or slow-ambient by day 4 (2nd).

Geomagnetic activity is expected to be mainly Quiet (Kp 0-2) initially, rising to Unsettled (Kp 3) with Active (Kp 4) intervals and a chance of G1/Minor or G2/Moderate storms upon the arrival of the coronal hole high speed stream from later on day 1 (30th March), lasting until day 3 (1st April). Geomagnetic activity will likely return back to Quiet to Unsettled (Kp 0-3) later on day 3 or by day 4 (April 1st-2nd).

Energetic Particles / Solar Radiation: No solar radiation storms are expected, but there remains a slight chance of reaching S1 or greater, should any significant flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	40	30	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	30	30
Very Active	R3 to R5 X	Yes	5	5	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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